# Chapter 7: Advanced Tab

The *Advanced* tab handles advanced routing and wireless settings. The advanced wireless settings should be used by technically advanced users who have a sufficient knowledge about wireless LAN technology. These settings should not be changed unless you know the effect the changes will have on your AirRouter HP.

## Advanced Wireless Settings

The 802.11n data rates include MCS0, MCS1, MCS2, MCS3, MCS4, MCS5, MCS6, MCS7 for 1x1 chain devices and MCS8, MCS9, MCS10, MCS11, MCS12, MCS13, MCS, MCS15 for 2x2 chains devices. The ACK timeout has a critical impact on performance in 802.11n outdoor links.
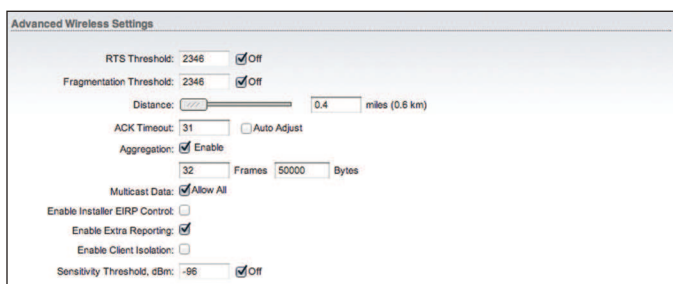


**RTS Threshold**  Determines the packet size of a transmission and, through the use of an access point, helps control traffic flow. The range is 0-2346 bytes, or word "off". The default value is 2346 which means that RTS is disabled.

RTS/CTS (Request to Send/Clear to Send) are the mechanisms used by the 802.11 wireless networking protocol to reduce frame collisions introduced by the hidden terminal problem. RTS/CTS packet size threshold is 0-2346 bytes. If the packet size the node wants to transmit is larger than the threshold, the RTS/CTS handshake gets triggered. If the packet size is equal to or less than threshold the data frame gets sent immediately.

The system uses a Request to Send/Clear to Send frames for the handshake which provide collision reduction for access point with hidden stations. The stations are sending a RTS frame first while data is send only after handshake with an AP is completed. Stations respond with the CTS frame to the RTS which provides clear media for the requesting station to send the data. CTS collision control management has a time interval defined during which all other stations hold off transmission and wait until the requesting station finishes transmission.

**Fragmentation Threshold**  Specifies the maximum size for a packet before data is fragmented into multiple packets. The range is 256-2346 bytes, or word "off". Setting the Fragmentation Threshold too low may result in poor network performance.

The use of fragmentation can increase the reliability of frame transmissions. When sending smaller frames, collisions are much less likely to occur. However lower values of the Fragmentation Threshold will result in lower throughput as well. It is recommended that you only make slight modifications or none at all to the Fragmentation Threshold value. The default setting of 2346 is optimum in most wireless network use cases.

The AirRouter HP has a new auto-acknowledgement timeout algorithm which dynamically optimizes the frame acknowledgement timeout value without user intervention. This is a critical feature required for stabilizing long-distance 802.11n outdoor links. The user also has the ability to enter the value manually, but it's not recommended.

**Distance**  Specify the distance value in miles (or kilometers) using the slider or entering the value manually. The signal strength and throughput falls off with range. Changing the distance value will change the ACK Timeout to the appropriate value of the distance.

**ACK Timeout**  Specify the ACK Timeout. Every time the station receives the data frame it sends an ACK frame to the AP (if transmission errors are absent). If the station receives no ACK frame from the AP within set timeout it re-sends the frame. The performance drops because if too many data frames are re-sent, thus if the timeout is set too short or too long, it will result poor connection and throughput performance.

Changing the ACK Timeout value will change the Distance to the appropriate distance value for the ACK Timeout.

- **Auto Adjust**  Control will enable the ACK Timeout Self-Configuration feature. If enabled, ACK Timeout value will be derived dynamically using an algorithm similar to the Conservative Rate Algorithm (used in AirOS v3.4). It is very recommended to use the Auto Adjust option for 802.11n.

  If two or more stations are located at a considerably different distance from the Access Point they are associated with, the highest ACK Timeout for the farthest station should be set on the AP side. The AirRouter HP includes an improved ACK Timeout algorithm.

**Aggregation**  A part of the 802.11n standard that allows sending multiple frames per single access to the medium by combining frames together into one larger frame. It creates the larger frame by combining smaller frames with the same physical source and destination end points and traffic class (i.e. QoS) into one large frame with a common MAC header.

- **Frames**  Determines the number of frames combined on the new larger frame.

- **Bytes**  Determines the size (in Bytes) of the larger frame.

**Multicast Data**  This option allows all the Multicast packet pass-through functionality. By default this option is disabled.

**Enable Extra Reporting**  Feature will report additional information (i.e. Device Name) in the 802.11 management frames. This information is commonly used for system identification and status reporting in discovery utilities and Router operating systems.

**Enable Client Isolation**  This option allows packets only to be sent from the external network to the CPE and vice verse (applicable for Access Point and Access Point WDS mode only). If Client Isolation is enabled, wireless stations connected to the same AP will not be able to interconnect on both the layer 2 (MAC) and layer 3 (IP) level. This is effective for associated stations and WDS peers as well.

**Sensitivity Threshold, dBm**  Defines the minimum client signal level accepted by the Access Point, for the client to remain associated. Any client with a signal level lower than that specified will be kicked out. This feature is helpful to maintain good signal levels within associated stations, assuring better overall performance.

- **Off**  Clearing the checkbox disables the feature.

## Advanced Ethernet Settings



**Enable Autonegotiation** When enabled, the device will automatically negotiate transmission parameters with the counterpart, such as speed and duplex. In this process, the connected devices first share their capabilities and then choose the fastest transmission mode they both support. If you want to specify the values manually, disable the *Enable Autonegotiation* option and select the values:

- **Link Speed, Mbps** Selects the maximum transmission link speed. There are two options: 10Mbps or 100Mbps. If running extra long Ethernet cables, a link speed of 10Mbps could help to achieve better stability.

- **Enable Full Duplex** Selects the duplex mode; if enabled, the device operates in Full Duplex (allowing bidirectional communication in both directions simultaneously). While disabled, the device operates in Half-Duplex mode (allowing bidirectional communication in both directions, but not simultaneously and only in one direction at a time.

## Traffic Shaping

Wireless Traffic shaping is dedicated to upstream and downstream bandwidth control while looking from the client (connected on the Ethernet interface) perspective.

The traffic can be limited at the AirRouter HP in the upload and download direction based on a user defined rate limit. This is layer 3 QoS.



**Enable Traffic Shaping** This option will enable bandwidth control on the device.

- **Incoming Traffic Limit** Specify the maximum bandwidth value (in kilobits per second, Kbps) for traffic passing from the wireless interface to the Ethernet interface.

- **Incoming Traffic Burst** Specify the data volume (in kilobytes) to which the Incoming Traffic Limit will not be effective afterwards data connection is initiated.

- **Outgoing Traffic Limit** Specify the maximum bandwidth value (in kilobits per second, Kbps) for traffic passing from the Ethernet interface to the wireless interface.

- **Outgoing Traffic Burst** Specify the data volume (in kilobytes) to which the Outgoing Traffic Limit will not be effective after data connection is initiated.

# Chapter 8: Services Tab

The *Services* tab covers the configuration of system management services including: Ping Watchdog, SNMP Agent, Web Server, SSH Server, Telnet Server, NTP Client, Dynamic DNS and System Log.

## Ping Watchdog

Ping Watchdog sets the AirRouter HP to continuously ping a user defined IP address (it can be the Internet gateway for example). If it is unable to ping under the user defined constraints, the AirRouter HP will automatically reboot. This option creates a kind of "fail-proof" mechanism.

Ping Watchdog is dedicated for continuous monitoring of the particular connection to remote host using the Ping tool. The Ping works by sending ICMP "echo request" packets to the target host and listening for ICMP "echo response" replies. If the defined number of replies is not received, the tool reboots the device.



**Enable Ping Watchdog**  Enables the Ping Watchdog tool.

- **IP Address To Ping**  Specify the IP address of the target host which to be monitored by the Ping Watchdog tool.

- **Ping Interval**  Specify time interval (in seconds) between the ICMP "echo requests" are sent by the Ping Watchdog Tool. The default value is *300* seconds.

- **Startup Delay**  Specify initial time delay (in seconds) until the first ICMP echo requests are sent by the Ping Watchdog tool. The default value is *300* seconds.

  The value of Startup Delay should be at least 60 seconds as the network interface and wireless connection initialization takes a considerable amount of time if the device is rebooted.

- **Failure Count to Reboot**  Specify the number of ICMP echo response replies. If the specified number of ICMP echo response packets is not received continuously, the Ping Watchdog tool will reboot the device. The default value is *3*.

## SNMP Agent

Simple Network Monitor Protocol (SNMP) is used in network management systems to monitor network-attached devices for conditions that warrant administrative attention. The AirRouter HP contains an SNMP agent which allows it to communicate to SNMP manage applications for network provisioning.

The SNMP Agent provides an interface for device monitoring using the Simple Network Management Protocol (an application layer protocol that facilitates the exchange of management information between network devices). SNMP Agent allows network administrators to monitor network performance, find and solve network problems. For the purpose of equipment identification, it is always a good idea to configure SNMP agents with contact and location information:



**Enable SNMP Agent**  Enables the SNMP Agent.

- **SNMP Community**  Specify the SNMP community string. It is required to authenticate access to MIB objects and functions as an embedded password. The device supports a Read-only community string that gives read access to authorized management stations to all the objects in the MIB except the community strings, but does not allow write access. The AirRouter HP supports SNMP v1. The default SNMP Community is *public*.

- **Contact**  Specify the contact who that should be notified in case an emergency situation arises.

- **Location**  Specify the physical location of the device.

## Web Server



The following Web Server parameters can be set:

**Use Secure Connection (HTTPS)**  If checked Web server will use secure HTTPS mode. HTTPS mode is unchecked by default.

- **Secure Server Port**  Defines the Web Server TCP/IP port *Use Secure Connection (HTTPS)* is enabled.

**Server Port**  Web Server TCP/IP port setting while using HTTP mode.

**Session timeout**  Specifies the maximum timeout before the session expires. Once a session expires, you must login again using the username and password.

## SSH Server

The following SSH Server parameters can be set:



**Enable SSH Server**  This option enables SSH access to the AirRouter HP.

- **Server Port**  SSH service TCP/IP port setting.

- **Enable Password Authentication**  When enabled, you must authenticate using Administrator credentials in order to grant SSH access to the device, otherwise an Authentication Key will be required.

- **Authorized Keys**  Click Edit to import a public key file working to get SSH access to the device instead of using an admin password. Click **Browse** to locate and select the key file, then click **Import**. Click **Save** to save your changes or **Close** to discard your changes.

## Telnet Server

The following Telnet Server parameters can be set:



**Enable Telnet Server**  This option activates the Telnet access to the AirOS Device.

**Server Port**  Telnet service TCP/IP port setting.
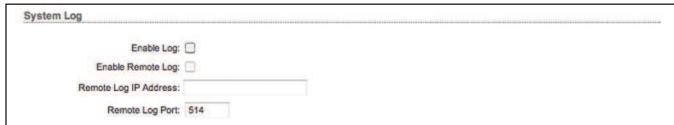
## NTP Client

The Network Time Protocol (NTP) is a protocol for synchronizing the clocks of computer systems over packet-switched, variable-latency data networks. It can be used to set the AirRouter HP system time. System Time is reported next to the every System Log entry while registering system events if the *Log* option is enabled.



**Enable NTP Client**  Enables the AirRouter HP to obtain the system time from a time server on the Internet.

- **NTP Server**  Specify the IP address or domain name of the NTP Server.

## System Log



**Enable Log**  This option enables the registration routine of the system log messages. By default it is disabled.

- **Enable Remote Log**  Enables the syslog remote sending function while System log messages are sent to a remote server specified in the *Remote Log IP Address* and *Remote Log Port* fields.

  - **Remote Log IP Address**  The host IP address where syslog messages should be sent. Remote host should be configured properly to receive syslog protocol messages.

  - **Remote Log Port**  The TCP/IP port of the host syslog messages should be sent. *514* is the default port for the commonly used system message logging utilities.

Every logged message contains at least a System Time and a Host Name. Usually a particular service name which generates the system event is specified also within the message. Messages from different services have different context and different level of the details. Usually error, warning or informational system service messages are reported, however more detailed Debug level messages can be reported also. The more detailed system messages are reported, the greater volume of log messages will be generated.

## Device Discovery

**Enable Discovery**  Enables device discovery, allowing the AirRouter HP to be discovered by other Ubiquiti Networks' devices through the built-in Device Discovery tool. See .
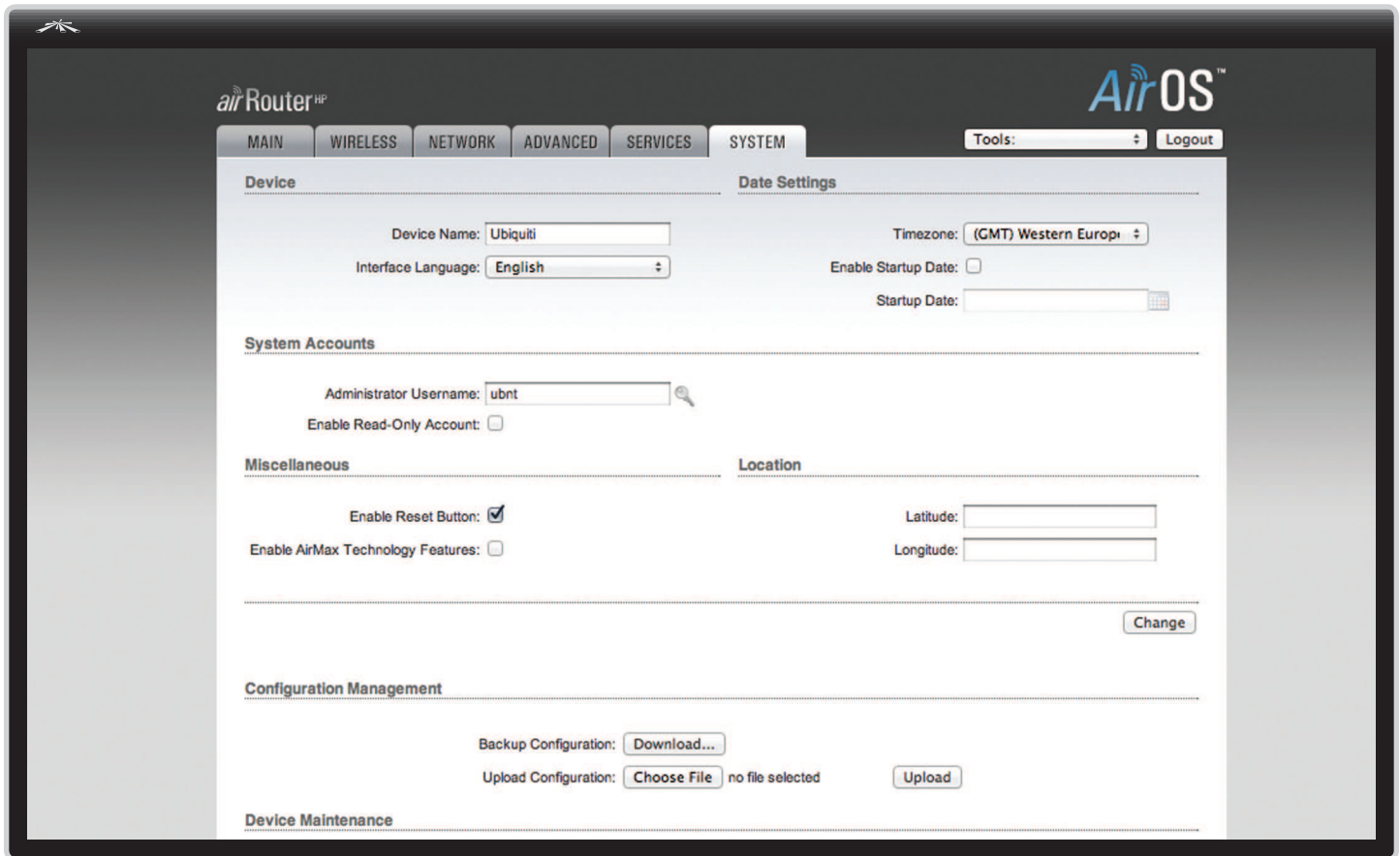
# Chapter 9: System Tab

The *System* tab contains administrative options. This tab enables the administrator to reboot the device, set it back to factory defaults, upload new firmware, enable AirMax Technology Features (and the *Ubiquiti Logo* tab), backup or update the configuration and configure the administrator account.

## Device

Device Name (Host name) is the system wide device identifier. It is reported by the SNMP Agent to authorized management stations. Device Name will be represented in popular Router Operating Systems registration screens and discovery tools.
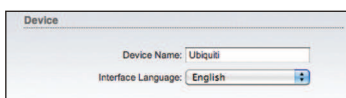


**Device Name**  Specifies the system identity.

**Interface Language**  Allows you to select the language displayed in the management interface. *English* is the default language.

Additional language profiles may be uploaded. Refer to our wiki page at the following URL:
**www.ubnt.com/wiki/How_to_import_Language_Profile**

## Date Settings
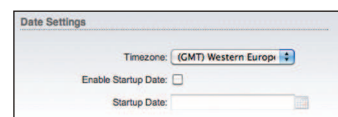


**Timezone**  Specifies the timezone according to GMT (Greenwich Mean Time).

**Enable Startup Date**  When enabled, you are able to modify the device's startup date.

• **Startup Date**  Specifies the device's startup date. You can select a date by clicking the **Calendar** icon or typinh it in manually. Type the date in the following format: 2 digit month/2 digit day/4 digit year. An example would be for May 20th, 2010 your would  type **05/20/2010**

## System Accounts

In this section you can modify the administrator password to protect your device from unauthorized configuration. The default administrator's password should be changed on the very first system setup:



**Administrator Username**  Specifies the name of the system user.

**Key Button**  Press this button in order to change the administrator password.

- **Current Password**  Enter the current password associated with the administrator account. It is required to change the *Password* or *Administrator Username*.

- **New Password**  Enter the new password for the administrator account.

- **Verify New Password**  Re-enter the new password for the administrator account.

> Note:  Password length is 8 characters maximum, passwords exceeding 8 characters will be truncated.

**Enable Read-Only Account**  Click to enable the read-only account and configure the username and password to protect your device from unauthorized access. The default option is *disabled*.

- **Read-Only Username**  Specifies the name of the system user.

- **Key button**  Press this button in order to change the Read-only password.

  - **New Password**  New password used for read-only administrator authentication should be specified.

  - **Show**  Check this to display the read-only password characters you have typed.

**Change**  Click to save changes to any of the fields on the *System* tab.

## Miscellaneous

**Enable Reset Button**  To prevent accidental device reset to default settings, check to enable the AirRouter HP's physical reset button. Clear to disable the AirRouter HP's physical reset button.



Even if the option is disabled, the device may still reset through the **TFTP Recovery Procedure**.

### Enable AirMax Technology Features

Adds the *Ubiquiti Logo* tab to the AirRouter HP Web Management interface which lists options for enabling, launching and modifying settings for Ubiquiti proprietary features including:

- **AirMax**  When enabled, provides superior wireless performance, more clients per Access Point (Access Point) and lower latency.

- **AirSelect**   An innovative technology that dynamically changes the wireless channel used in order to avoid interference.

- **AirView**  Ubiquiti's spectrum analyzer.

## Location

Latitude and Longitude define the device coordinates; they are used to automatically update device location in AirControl.



## Configuration Management

The AirRouter HP configuration is stored in plain text file (cfg file). Use the *Configuration Management* controls to backup, restore or update the system configuration file:



**Backup Configuration**  Click **Download** to download the current system configuration file.

**Upload Configuration**  Click **Choose File** to navigate to and select the new configuration file or specify the full path to the configuration file location. Click **Upload** to use a previously downloaded configuration file to the system. The settings of the new configuration will be visible in the *Wireless*, *Network*, *Advanced*, *Services* and *System* tabs of the Web Management Interface.

> Note:  The new configuration is active after clicking **Apply** and the system reboot cycle is completed. The previous system configuration is deleted after you click **Apply**. It is highly recommended to backup the system configuration before uploading the new configuration.

# Device Maintenance

The controls in this section are dedicated for the device maintenance routines: rebooting, resetting, generating of the support information report.
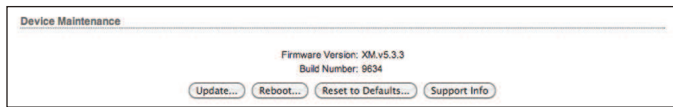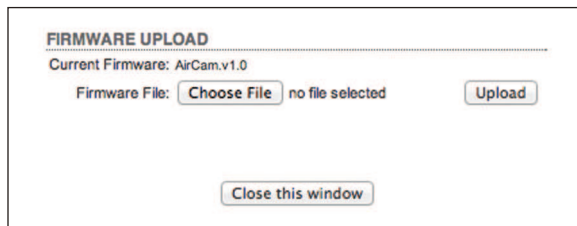


**Firmware Version**  Shows the current firmware version.

**Build Number**  Displays the build number of the firmware version loaded.

**Update**  Click to update the device with new firmware.



- **Firmware Upload**

The device firmware update is compatible with all configuration settings. System configurations are preserved while the device is updated with a new firmware version.

- **Current Firmware**  Displays the version of the AirOS firmware which is currently operating.

- **Firmware File**  Click **Browse** to locate new firmware file. Select the file and click **Open**. Once you've selected a new firmware file, click **Upload** to upload the new firmware to the device. Click **Close this window** to cancel the new firmware upload process.

- **Update**  Click the *Update* button to proceed with the firmware upgrade routine (new firmware image should be uploaded into the system first). Please be patient, as the firmware upgrade routine can take 3-7 minutes. The AirRouter HP will be inaccessible until the firmware upgrade routine is completed.

- Do not switch off, do not reboot and do not disconnect the device from the power supply during the firmware upgrade process as these actions will damage the device!

- It is highly recommended that you back up the system configuration and the Support Info file before uploading the new configuration.

- **Close this window**  At this point, closes the firmware upgrade window if activated. This action will not cancel the firmware upgrade process.

**Reboot**  Click *Reboot* in order to initiate the full reboot cycle of the device. Reboot is the same as the hardware reboot which is similar to the power off - power on cycle. The system configuration is not modified after the reboot cycle completes. Any non-applied changes will be lost.

**Reset to Defaults**  Use this to reset the AirRouter HP to the factory default settings. This option will reboot the AirRouter HP and all factory default settings will be restored. You may want to use the *Backup Configuration* option to download your current settings before selecting this option.

**Support Info**  This will generate a support information file that the Ubiquiti support engineers can use when providing customer support. This file only needs be generated at their request.

## Tools

AirOS on the AirRouter HP includes network administration and monitoring tools that are available on every tab.

- Align Antenna
- Site Survey
- Ping
- Traceroute
- Speed Test
- AirView



### Align Antenna

The *Align Antenna* utility allows the installer to point and optimize the antenna in the direction of maximum link signal.

Selection of the *Align Antenna* tool will open a new window with signal strength indicator. Window reloads every second displaying the signal strength of the last received packet.
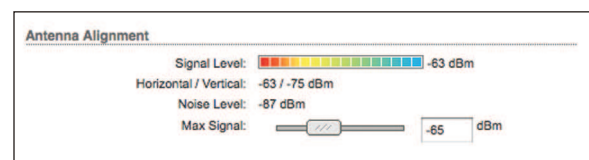


**Signal Level/Horizontal/Vertical**  Displays the received wireless signal levels for each polarity, while operating in Station (or Station WDS) mode on MIMO 2x2 devices. Signals Strength is measured in dBm.

**Noise Level**  Value displays the value of the noise level wireless signal was received.

**Max Signal**  The *Max Signal* slider bar allows the range of the meter to be either increased or reduced. If the range is reduced, the color change will be more sensitive to signal fluctuations indicating the offset of the maximum indicator value and the scale itself.

## Site Survey

The *Site Survey* tool will search for wireless networks in range on all supported channels while the device is operating in *Access Point* or *Station* mode. In *Station* mode, the channel list can be modified.

Site Survey reports the MAC Address, SSID, Device Name, Encryption type (if any), Signal Strength/Noise in dBm, Frequency in GHz and the wireless channel of all surrounding Access Points.
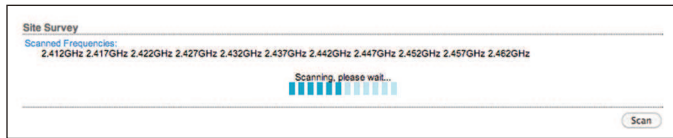


**Scan**  Refresh the window using the **Scan** button.

## Discovery

The *Device Discovery* tool will scan for all Ubiquiti Networks devices within the network the AirRouter HP is a member of. The search field will automatically filter devices containing specified names or numbers as you type them.
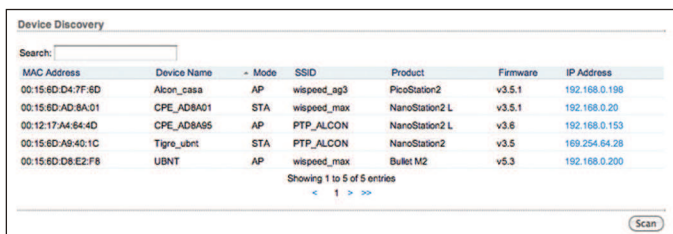


**Device Discovery**  Shows device MAC Address, Device Name, Wireless Mode, SSID, Product type, Firmware version and IP Address. To access a device configuration through his Web GUI, click the device's IP Address.

**Scan**  Discovery can be updated using the *Scan* button.

## Ping

The *Ping* tool will ping other devices on the network directly from the AirOS device and is used to check the preliminary link quality and packet latency estimation between two network devices using ICMP packets.

### Network Ping
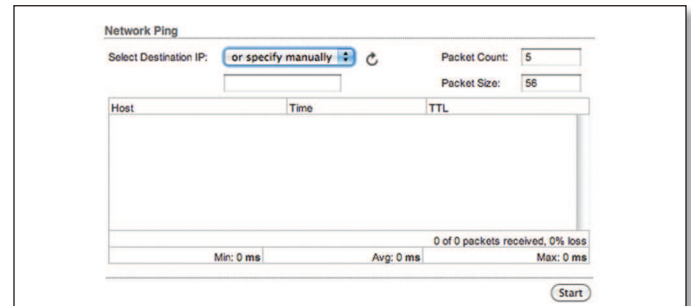


**Select Destination IP**  A remote system IP can be selected from the list which is generated automatically or can be specified manually.

**Packet Count**  Enter the number of packets to send for the ping test.

**Packet Size**  The size of the ICMP packets can be specified in this field.

**Start**  The test is started using this button.

Packet loss statistics and latency time evaluation is provided after the test is completed.

### Traceroute

The *TraceRoute* tool allows tracing the hops from the AirRouter HP to a selected outgoing IP address. It should be used for finding the route taken by ICMP packets across the network to the Destination host.
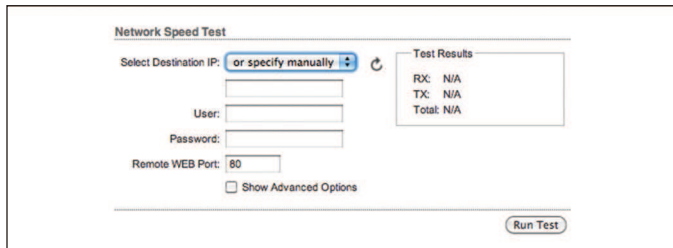


**Destination Host**  Enter the IP address of the destination host to which you want to find the route.

**Resolve IP Addresses**  Resolution of the IP addresses (symbolically rather than numerically) can be enabled by selecting this option.

**Start**  The test is started using this button.

## Speed Test

The *Speed Test* tool allows you to test the connection speed between two Ubiquiti Networks devices that are using firmware version 5.2 or above. It should be used for a preliminary throughput estimation between two network devices.



**Select Destination IP**  A remote system IP can be selected from the list, which is generated automatically (Select destination IP) or may be specified manually.

Remote system access credentials (administrator username - User and Password) should be provided for the communication between two AirOS-powered devices. This is required in order to establish the TCP/IP based throughput test.

**Remote WEB port**  The remote Web port the AirOS powered device should be specified in order to establish TCP/IP based throughput test (i.e. 443 port should be specified if HTTPS is enabled in the remote system). The ICMP throughput measurement routine will be initiated if the WEB port of the remote system is incorrect.

**Show Advanced Options**  Enables additional *Speed Test* tool options. There are 3 options available for the traffic direction while estimating the throughput maximum:

**Direction**  There are three directions to choose from:

- **Duplex**  Estimates the incoming (Rx) and the outgoing (Tx) throughput at the same time.
- **Receive**  Estimates the incoming (Rx) throughput.
- **Transmit**  Estimates the outgoing (Tx) throughput.

**Test Results**  Displays three result categories:

- **Rx**  Displays the estimated incoming throughput.
- **Tx**  Displays the estimated out-coming throughput.
- **Total**  Displays the aggregated throughput.

## AirView

AirView is a Spectrum Analyzer allowing you to see the crowdedness of the radio spectrum. You need to run this tool on a system connected to the AirRouter HP via Ethernet. All wireless connections will be disconnected from the AirRouter HP.

**AirView**  Click **Airview** from the Tools menu to launch AirView. On first use, the following window appears.
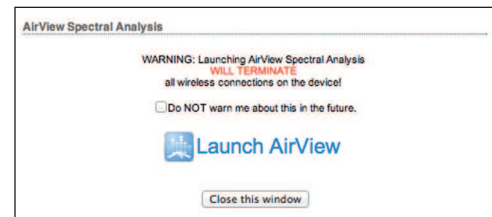


- **Do NOT warn me about this in the future**  Select the check box to bypass this window in future launches of AirView Spectrum Analyzer.

**Launch AirView**  Click **Launch Airview** to download the Java Network Launch Protocol (jnlp) file and complete launch of AirView. Java Runtime Environment 1.6 (or above) is required on the client machine to use AirView.
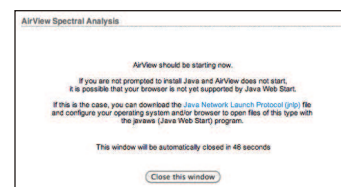


**Close this window**  Click *Close this window* to cancel AirView launch and close this window.

> **Note:**  Launching AirView will terminate all wireless connections on the device.

## Main View

**Device**  Displays the device name, MAC and IP Address of the device running AirView.

**Total RF Frames**  Displays the total number of RF frames gathered for as long as AirView has been running or since the "Reset All Data" button was pressed.

**FPS**  Indicates the total number of frames gathered per second. The wider the interval amplitude, the fewer frames per second will be gathered.

**Reset All Data**  Press this button to reset all gathered data. Use this function when you want to analyze the spectrum for another place or address.



## View

**Enable Chart Panel 1 (top)**  Enable this option to display the top chart, Waterfall or Channel Usage, depending on which you have selected in Preferences. These are 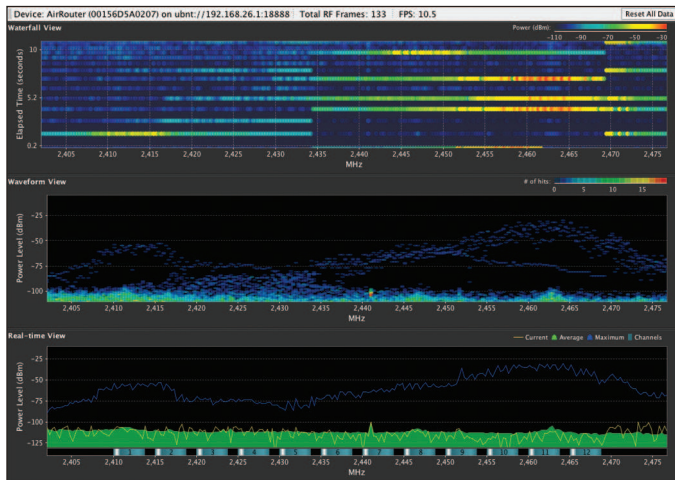time-based graphs showing the aggregate energy collected or Channel Usage over time for each frequency for as long as AirView has been running.

**Enable Chart Panel 2 (middle)**  Enable this option to display the middle chart, Waveform. This a time-based graph showing the aggregate energy collected for each frequency over time. The color of the energy designates its amplitude: colder colors stand for lower energy levels (with blue representing the lowest levels) at that frequency bin, whereas warmer colors (like yellow, orange or red) mean higher energy levels at that frequency bin.

**Enable Chart Panel 3 (bottom)**  When enabled, this graph displays a traditional Spectrum Analyzer in which energy (in dBm) is shown in real-time as a function of frequency.

**Clear All Markers**  Press to reset all previously assigned markers. Markers are assigned by clicking a point, which corresponds with a frequency, on the third chart.

**Preferences**  In this section you can modify AirView Settings, such as enabling or disabling charts, or specifying the frequency interval.

### Preferences

#### Charts
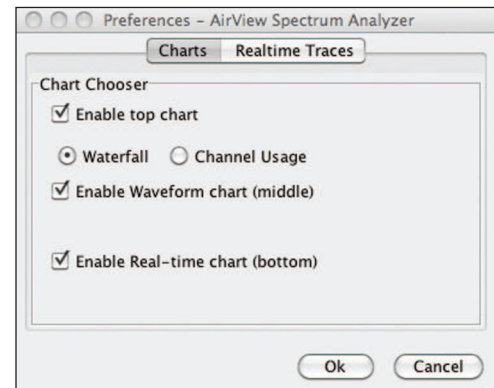


**Enable Top Chart**  Select the chart to be displayed in the top chart on the main view. There are two options:

- **Waterfall**  This is a time-based graph showing the aggregate energy collected over time for each frequency while AirView has been running. The color of energy designates its amplitude. Colder colors stand for lower energy levels (with blue representing the lowest levels) at that frequency bin, whereas warmer colors (like yellow, orange or red) mean higher energy levels at that frequency bin.

  The Waterfall View's legend (top-right corner) provides a numerical guide associating the various colors to power levels (dBm). The low end of that legend (left) is always adjusted to the calculated noise floor, and the high end (right) is set to the highest detected power level since the start of the session.

- **Channel Usage**  In this graph, each 2.4GHz Wi-Fi channel is represented by a bar displaying a percentage showing the relative "crowdedness" of that specific channel. This percentage is calculated by analyzing both the popularity and the strength of RF energy in that channel since the start of an AirView session.

**Enable Waveform chart (middle)**  Like the Waterfall chart, this a time-based graph showing the aggregate energy collected for each frequency over time while AirView has been running. The color of the energy designates its amplitude: colder colors stand for lower energy levels (with blue representing the lowest levels) at that frequency bin, whereas warmer colors (like yellow, orange or red) mean higher energy levels at that frequency bin.

The spectral view over time will essentially display the steady-state RF energy signature of a given environment.

**Enable Real-time chart (bottom)**  This graph displays a traditional Spectrum Analyzer in which energy (in dBm) is shown in real time as a function of frequency. There are three traces in this view:

• **Current**  (Yellow) Shows the real-time energy seen by the AirRouter HP as a function of frequency.

• **Average**  (Green) Shows the running average energy across frequency.

• **Maximum**  (Blue) This trace will update and hold maximum power levels across the frequency since the start of an AirView session.

**Realtime Traces**

The following settings apply only to the Real-time chart:
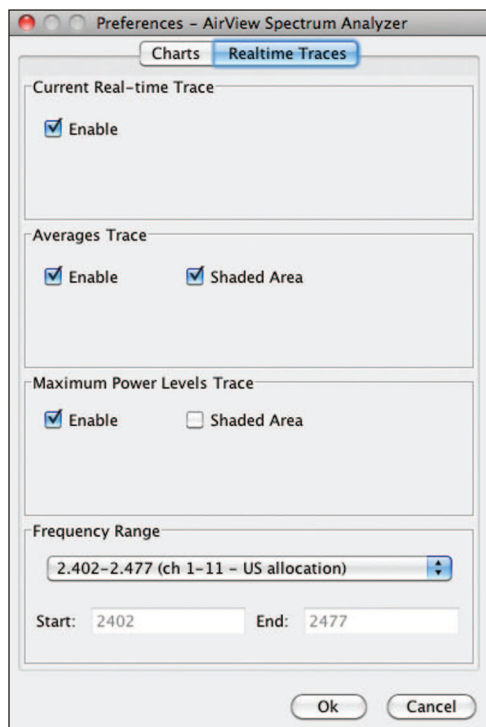


**Current Real-time Trace**  When enabled, the real-time trace will be turned on. This is the yellow outline on the *Real-time* chart, which represents real-time power level of each frequency. The refresh speed depends on the FPS.

**Averages Trace**  This is the green area on the *Real-time* chart, which represents the average received power level and considers data for as long as AirView has been running. You can disable this graph by unchecking the *Enable* checkbox. You may enable only a green outline, without the shaded area, by unchecking the *Shaded Area* checkbox.

**Maximum Power Trace**  This is the blue area on the third chart, which represents the maximum received power level and considers data for as long as AirView has been running. You can disable this graph by unchecking the *Enable* checkbox. You may enable only a blue outline, without the shaded area, by unchecking the *Shaded Area* checkbox.

**Frequency Range**  Here you can select the amplitude of the frequencies interval to be scanned. There are some pre-defined ranges for the most popular bands. However, you can specify a custom range according to your needs.
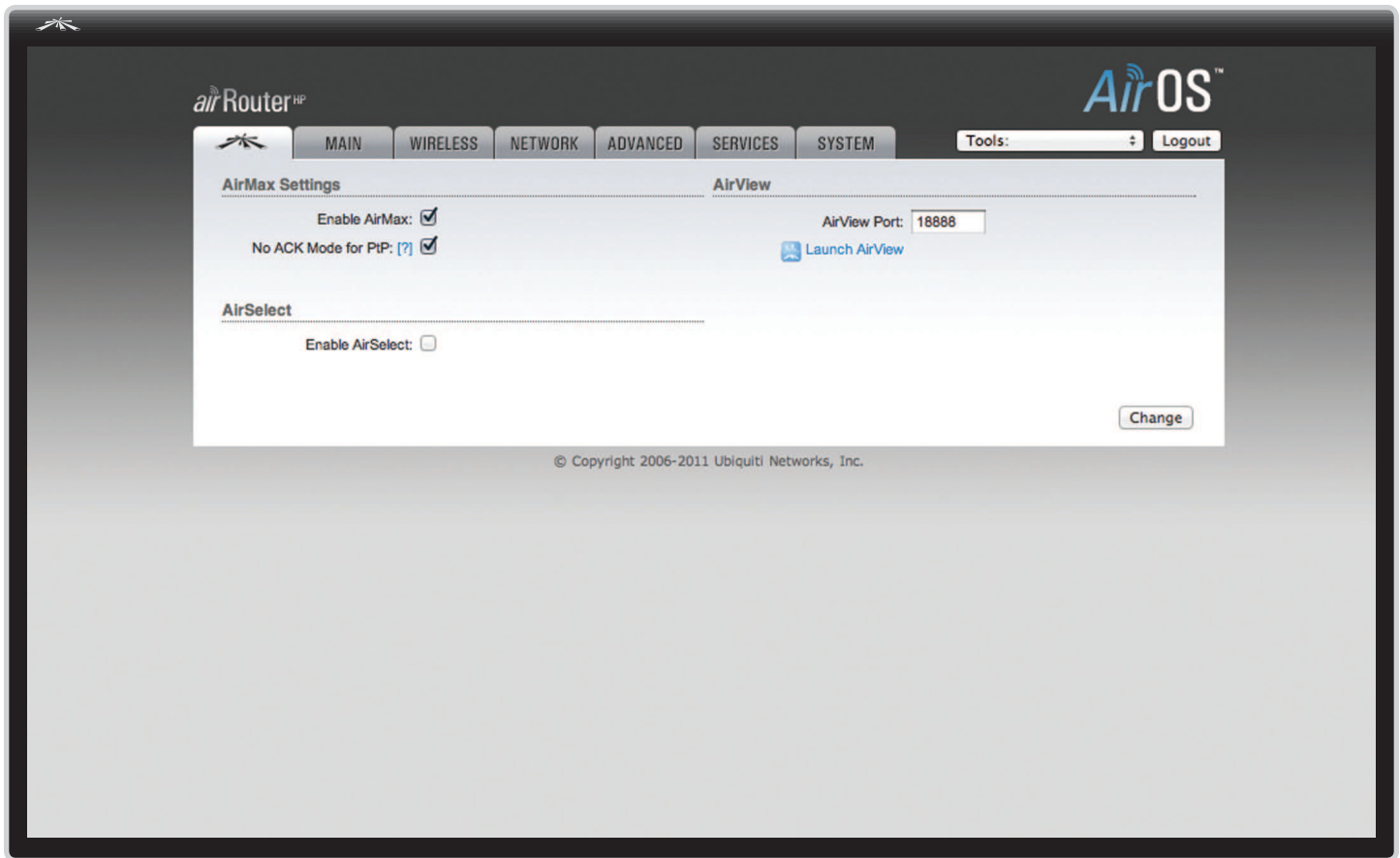
# Chapter 10: Ubiquiti Logo Tab

The *Ubiquiti Logo* tab lists options for enabling, launching and modifying settings for Ubiquiti proprietary features including:

• **AirMax**  When enabled, provides superior wireless performance, more clients per Access Point (Access Point) and lower latency.

• **AirSelect**   An innovative technology that dynamically changes the wireless channel used in order to avoid interference.

• **AirView**  Ubiquiti's spectrum analyzer.

> Note: The *Ubiquiti Logo* tab is only visible when *Enable AirMax Technology Features* is selected under *System* tab > *Miscellaneous.*

# AirMax Settings

AirMax is Ubiquiti's proprietary Time Division Multiple Access (TDMA) polling technology. AirMax offers better tolerance against interference and increases the maximum number of users associated to an Access Point (Access Point) that is AirMax capable. AirMax works by assigning time slots for each device communication, to avoid the "hidden node" problem, which occurs when a node is visible from a wireless access Access Point, but not from other nodes communicating with the originating Access Point.

While operating in *Access Point* or *Access Point WDS* mode with AirMax enabled, the device only accepts AirMax stations.

> Note: Disable AirMax for legacy 802.11a/b/g device compatibility.

*AirMax Settings* include:
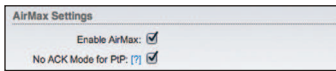


- **Enable AirMax**  This feature is available when the device is in *Access Point* or *Access Point WDS* mode under the *Wireless* tab > *Wireless Mode*. If enabled, the device will operate in AirMax mode, including all its benefits. When AirMax is activated, the device only accepts connections from AirMax stations.

  > Note: When the device is in *Station* or *Station WDS* mode under the *Wireless* tab > *Wireless Mode*, AirMax will be selected automatically when connecting to an AirMax Access Point.

- **No ACK Mode for PtP**  Acknowledgment (ACK) timeout settings are limited by device hardware specifications. *No ACK Mode for PtP* should be used in a Point to Point (PtP) situation where actual link distance exceeds hardware ACK timeout limits (17km in 40MHz mode or 51km in 20MHz mode). In all other scenarios, static or automatically-adjusted values should be used (See the *Advanced* tab > *Advanced Wireless Settings* > *ACK Timeout* to adjust ACK timeout settings).

  > Important: While *No ACK Mode for PtP* is enabled, only one station can be connected. To connect more than one station, select *Auto Adjust* mode under the *Advanced* tab > *Advanced Wireless Settings* > *ACK Timeout*.

- **AirMax Priority**  This feature (available when the device is in *Station* or *Station WDS* mode under the *Wireless* tab > *Wireless Mode*), defines the amount of time slots (or Airtime) assigned to each client.
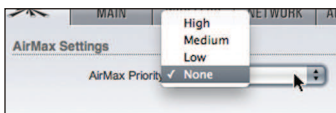


- By default the Access Point will give all active clients the same amount of time. However, if the clients are configured with different priorities, the Access Point will give clients more or less time, depending on the priority.

  *AirMax Priority* options include:
  - None: 1 time slot (Default setting for clients; 1:1 ratio)
  - Low: 2 time slots (2:1 ratio)
  - Medium: 3 time slots (3:1 ratio)
  - High: 4 time slots (4:1 ratio)

Clients with a higher priority have access to more of the Access Point's airtime, providing higher possible throughput and lower latency when sharing with other active clients. For example, if there are 3 clients, 1 set to *None*, 1 set to *Medium*, and 1 set to *High*, the *None* client will get 1 time slot, the *Medium* client will get 3 time slots, and the *High* client will get 4 time slots.

> Note: AirMax Priority only functions when multiple clients have it enabled.

## AirSelect

AirSelect is a technology that avoids interference and increases throughput by dynamically changing the wireless channel by periodically hopping to the least-used channel in the Frequency List (user defined) within a designated time interval (user-defined in *ms,* or milliseconds). Furthermore, AirSelect tracks interference levels on each channel used, hopping to those with the least amount of interference more frequently.

> Note: AirMax Priority only functions when multiple clients have it enabled.

*AirSelect* options include:
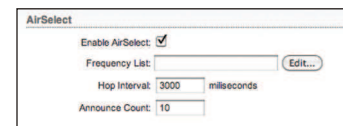


- **Enable AirSelect**  Selecting the check box enables AirSelect. Clearing the check box disables AirSelect. When AirSelect is enabled, the Access Point and all associated clients will quickly hop between frequencies attempting to avoid interference.

- **Frequency List**  Available when AirSelect is enabled. Clicking **Edit** allows the selection of frequencies that the Access Point will use for AirSelect. Available frequencies will vary based on the Ubiquiti M Series product being configured.
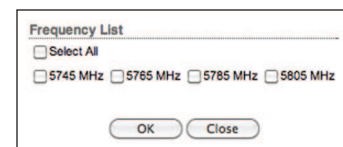


- **Hop Interval**  Available when AirSelect is enabled. The duration (in milliseconds) that the Access Point will stay on one frequency before moving to the next. The default value is 3000ms.

- **Announce Count**  Available when AirSelect is enabled. *Announce Count* is the number of times between hops the Access Point will announce the next hop information (frequency, etc) to clients . For instance, if the *Hop Interval* is set to 10000ms, and *Announce Count* is set to 10, every 1000ms the Access Point will send an announcement to the clients with upcoming hop information. The larger the time period between Announce Count and Hop Interval, the higher risk of timing drift (hops not being synchronized), so it is recommended to keep the *Hop Interval* set to every 100ms (or *Announce Count* to 1/100th of *Hop Interval*).

## AirView

**AirView**  Click **Launch Airview.**



For more information on configuration and usage, see **"AirView" on page 45**.

# Appendix A: Specifications

| | |
|---|---|
| Dimensions | 162 X 132 X 30 mm |
| Weight | 318 g |
| Ports | (1) 10/100 WAN Ethernet Port |
| | (4) 10/100 LAN Ethernet Ports<br>1 USB 2.0 Port<br>1 Power Port |
| Buttons | 1 Reset Button |
| LEDs | 4 LAN |
| | 1 Main (WAN by default) |
| | 1 Internet |
| | 1 WLAN (Wireless LAN) |
| | 1 Power |
| Wireless Security | WEP, WPA, and WPA2 |
| Wi-Fi Standards | 802.11 b/g/n |
| Bands | 2.4 GHz |
| Antennas | RP-SMA External Antenna |
| Power Method | Passive Power over Ethernet |
| | 5V DC Input via WAN Port |
| Operating Temperature | -20 to 60° C |
| Storage Temperature | -40 to 70° C |
| Certifications | CE, FCC, IC |

# Appendix B: Safety Notices

1.  Read, follow, and keep these instructions.

2.  Heed all warnings.

3.  Only use attachments/accessories specified by the manufacturer.

    ⚠️  WARNING: Do not use this product in location that can be submerged by water.

    ⚠️  WARNING: Avoid using this product during an electrical storm. There may be a remote risk of electric shock from lightning.

## Electrical Safety Information

1.  Compliance is required with respect to voltage, frequency, and current requirements indicated on the manufacturer's label. Connection to a different power source than those specified may result in improper operation, damage to the equipment or pose a fire hazard if the limitations are not followed.

2.  There are no operator serviceable parts inside this equipment. Service should be provided only by a qualified service technician.

3.  This equipment is provided with a detachable power cord which has an integral safety ground wire intended for connection to a grounded safety outlet.

    a.  Do not substitute the power cord with one that is not the provided approved type. Never use an adapter plug to connect to a 2-wire outlet as this will defeat the continuity of the grounding wire.

    b.  The equipment requires the use of the ground wire as a part of the safety certification, modification or misuse can provide a shock hazard that can result in serious injury or death.

    c.  Contact a qualified electrician or the manufacturer if there are questions about the installation prior to connecting the equipment.

    d.  Protective earthing is provided by Listed AC adapter. Building installation shall provide appropriate short-circuit backup protection.

    e.  Protective bonding must be installed in accordance with local national wiring rules and regulations.

# Appendix C: Warranty

## General Warranty

UBIQUITI NETWORKS, Inc ("UBIQUITI NETWORKS") represents and warrants that the Products furnished hereunder shall be free from defects in material and workmanship for a period of one (1) year from the date of shipment by UBIQUITI NETWORKS under normal use and operation. UBIQUITI NETWORKS sole and exclusive obligation under the foregoing warranty shall be to repair or replace, at its option, any defective Product that fails during the warranty period. The expense of removal and reinstallation of any item is not included in this warranty.

The foregoing warranty is exclusive and in lieu of all other warranties, express or implied, including the implied warranties of merchantability and fitness for a particular purpose and any warranties arising from a course of dealing, usage or trade practice with respect to the products. Repair or replacement in the manner provided herein shall be the sole and exclusive remedy of Buyer for breach of warranty and shall constitute fulfillment of all liabilities of UBIQUITI NETWORKS with respect to the quality and performance of the Products. UBIQUITI NETWORKS reserves the right to inspect all defective Products (which must be returned by Buyer to UBIQUITI NETWORKS factory freight prepaid).

No Products will be accepted for replacement or repair without obtaining a Return Materials Authorization (RMA) number from UBIQUITI NETWORKS. Products returned without an RMA number will not be processed and will be returned to Buyer freight collect. UBIQUITI NETWORKS shall have no obligation to make repairs or replacement necessitated by catastrophe, fault, negligence, misuse, abuse, or accident by Buyer, Buyer's customers or any other parties. The warranty period of any repaired or replaced. Product shall not extend beyond its original term.

## Warranty Conditions

The foregoing warranty shall apply only if:

(I)   The Product has not been subjected to misuse, neglect or unusual physical, electrical or electromagnetic stress, or some other type of accident.

(II)  No modification, alteration or addition has been made to the Product by persons other than UBIQUITI NETWORKS or UBIQUITI NETWORK'S authorized representatives or otherwise approved by UBIQUITI NETWORKS.

(III) The Product has been properly installed and used at all times in accordance, and in all material respects, with the applicable Product documentation.

(IV) All Ethernet cabling runs use CAT5 (or above) shielded cabling.

## Disclaimer

UBIQUITI NETWORKS does not warrant that the operation of the products is error-free or that operation will be uninterrupted. In no event shall UBIQUITI NETWORKS be responsible for damages or claims of any nature or description relating to system performance, including coverage, buyer's selection of products for buyer's application and/or failure of products to meet government or regulatory requirements.

## Returns

In the unlikely event a defect occurs, please work through the dealer or distributor from which this product was purchased.

# Appendix D: Compliance Information

## Installer Compliance Responsibility

Devices must be professionally installed and it is the professional installer's responsibility to make sure the device is operated within local country regulatory requirements.

## FCC

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provice reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operations of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## RF Exposure Warning

The transceiver described here emits radio frequency energy. Although the power level is low, the concentrated energy from a directional antenna may pose a health hazard. Do not allow people to come closer than 20 cm to the antenna when the transmitter is operating.

Additional information on RF exposure is available on the Internet at **www.fcc.gov/oet/info/documents/bulletins**

L'émetteur-récepteur décrit ici émet de l'énergie de fréquence radio. Bien que le niveau de puissance est faible, l'énergie concentrée à partir d'une antenne directionnelle peut présenter un danger pour la santé. Ne pas permettre aux gens de se rapprocher de 20 cm à l'antenne lorsque l'émetteur est en marche.

Des renseignements supplémentaires sur l'exposition aux RF est disponible sur Internet à **www.fcc.gov/oet/info/documents/bulletins**

## Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

To reduce potential radio inteference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

Cet appareil numérique de la classe A est confrome à la norme NMB-003 Canada. Son fonctionnement est soumis aux deux conditions suivantes:

1. Cet appareil ne peut pas provoquer d'interférences et
2. Cet appareil doit accepter toute interférence, y compris les interférences susceptibles de provoquer un fonctionnement du dispositif.

Pour réduire le risque d'interférence aux autres utilisateurs, l'antenne type et son gain doivent être choisies de façon que l'équivalent puissance isotrope rayonnée équivalente (pire) n'est pas plus que cela autorisé pour une communication réussie.

## CE Marking

CE marking on this product represents the product is in compliance with all directives that are applicable to it.

### Alert sign! Follows CE marking

Alert sign must be indicated if a restriction on use applied to the product and it must follow the CE marking.



### NB-Identification number (if there is any)

Notified body number is indicated if it is involved in the conformity assessment procedure.



Please check the CE mark on the product label to find out which notified body was involved during assessment.

# RoHS/WEEE Compliance Statement



## English

European Directive 2002/96/EC requires that the equipment bearing this symbol on the product and/or its packaging must not be disposed of with unsorted municipal waste. The symbol indicates that this product should be disposed of separately from regular household waste streams. It is your responsibility to dispose of this and other electric and electronic equipment via designated collection facilities appointed by the government or local authorities. Correct disposal and recycling will help prevent potential negative consequences to the environment and human health. For more detailed information about the disposal of your old equipment, please contact your local authorities, waste disposal service, or the shop where you purchased the product.

## Deutsch

Die Europäische Richtlinie 2002/96/EC verlangt, dass technische Ausrüstung, die direkt am Gerät und/oder an der Verpackung mit diesem Symbol versehen ist , nicht zusammen mit unsortiertem Gemeindeabfall entsorgt werden darf. Das Symbol weist darauf hin, dass das Produkt von regulärem Haushaltmüll getrennt entsorgt werden sollte. Es liegt in Ihrer Verantwortung, dieses Gerät und andere elektrische und elektronische Geräte über die dafür zuständigen und von der Regierung oder örtlichen Behörden dazu bestimmten Sammelstellen zu entsorgen. Ordnungsgemäßes Entsorgen und Recyceln trägt dazu bei, potentielle negative Folgen für Umwelt und die menschliche Gesundheit zu vermeiden. Wenn Sie weitere Informationen zur Entsorgung Ihrer Altgeräte benötigen, wenden Sie sich bitte an die örtlichen Behörden oder städtischen Entsorgungsdienste oder an den Händler, bei dem Sie das Produkt erworben haben.

## Español

La Directiva 2002/96/CE de la UE exige que los equipos que lleven este símbolo en el propio aparato y/o en su embalaje no deben eliminarse junto con otros residuos urbanos no seleccionados. El símbolo indica que el producto en cuestión debe separarse de los residuos domésticos convencionales con vistas a su eliminación. Es responsabilidad suya desechar este y cualesquiera otros aparatos eléctricos y electrónicos a través de los puntos de recogida que ponen a su disposición el gobierno y las autoridades locales. Al desechar y reciclar correctamente estos aparatos estará contribuyendo a evitar posibles consecuencias negativas para el medio ambiente y la salud de las personas. Si desea obtener información más detallada sobre la eliminación segura de su aparato usado, consulte a las autoridades locales, al servicio de recogida y eliminación de residuos de su zona o pregunte en la tienda donde adquirió el producto.

## Français

La directive européenne 2002/96/CE exige que l'équipement sur lequel est apposé ce symbole sur le produit et/ou son emballage ne soit pas jeté avec les autres ordures ménagères. Ce symbole indique que le produit doit être éliminé dans un circuit distinct de celui pour les déchets des ménages. Il est de votre responsabilité de jeter ce matériel ainsi que tout autre matériel électrique ou électronique par les moyens de collecte indiqués par le gouvernement et les pouvoirs publics des collectivités territoriales. L'élimination et le recyclage en bonne et due forme ont pour but de lutter contre l'impact néfaste potentiel de ce type de produits sur l'environnement et la santé publique. Pour plus d'informations sur le mode d'élimination de votre ancien équipement, veuillez prendre contact avec les pouvoirs publics locaux, le service de traitement des déchets, ou l'endroit où vous avez acheté le produit.

## Italiano

La direttiva europea 2002/96/EC richiede che le apparecchiature contrassegnate con questo simbolo sul prodotto e/o sull'imballaggio non siano smaltite insieme ai rifiuti urbani non differenziati. Il simbolo indica che questo prodotto non deve essere smaltito insieme ai normali rifiuti domestici. È responsabilità del proprietario smaltire sia questi prodotti sia le altre apparecchiature elettriche ed elettroniche mediante le specifiche strutture di raccolta indicate dal governo o dagli enti pubblici locali. Il corretto smaltimento ed il riciclaggio aiuteranno a prevenire conseguenze potenzialmente negative per l'ambiente e per la salute dell'essere umano. Per ricevere informazioni più dettagliate circa lo smaltimento delle vecchie apparecchiature in Vostro possesso, Vi invitiamo a contattare gli enti pubblici di competenza, il servizio di smaltimento rifiuti o il negozio nel quale avete acquistato il prodotto.

# Appendix E: Declaration of Conformity

| | |
|---|---|
| **Česky [Czech]** | UBIQUITI NETWORKS tímto prohla uje, e tento UBIQUITI NETWORKS device, je ve shod se základními po adavky a dal ími p íslu n mi ustanoveními sm rnice 1999/5/ES. |
| **Dansk [Danish]** | Undertegnede UBIQUITI NETWORKS erklærer herved, at følgende udstyr UBIQUITI NETWORKS device, overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF. |
| **Nederlands [Dutch]** | Hierbij verklaart UBIQUITI NETWORKS dat het toestel UBIQUITI NETWORKS device, in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG. |
| | Bij deze verklaart UBIQUITI NETWORKS dat deze UBIQUITI NETWORKS device, voldoet aan de essentiële eisen en aan de overige relevante bepalingen van Richtlijn 1999/5/EC. |
| **English** | Hereby, UBIQUITI NETWORKS, declares that this UBIQUITI NETWORKS device, is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. |
| **Eesti [Estonian]** | Käesolevaga kinnitab UBIQUITI NETWORKS seadme UBIQUITI NETWORKS device, vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele. |
| **Suomi [Finnish]** | UBIQUITI NETWORKS vakuuttaa täten että UBIQUITI NETWORKS device, tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen. |
| **Français [French]** | Par la présente UBIQUITI NETWORKS déclare que l'appareil UBIQUITI NETWORKS, device est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE. |
| | Par la présente, UBIQUITI NETWORKS déclare que ce UBIQUITI NETWORKS device, est conforme aux exigences essentielles et aux autres dispositions de la directive 1999/5/CE qui lui sont applicables. |
| **Deutsch [German]** | Hiermit erklärt UBIQUITI NETWORKS, dass sich diese UBIQUITI NETWORKS device, in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie 1999/5/EG befindet". (BMWi) |
| | Hiermit erklärt UBIQUITI NETWORKS die Übereinstimmung des Gerätes UBIQUITI NETWORKS device, mit den grundlegenden Anforderungen und den anderen relevanten Festlegungen der Richtlinie 1999/5/EG. (Wien) |
| **Ελληνική [Greek]** | ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ UBIQUITI NETWORKS ΔΗΛΩΝΕΙ ΟΤΙ UBIQUITI NETWORKS device, ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1995/5/ΕΚ. |
| **Magyar [Hungarian]** | Alulírott, UBIQUITI NETWORKS nyilatkozom, hogy a UBIQUITI NETWORKS device, megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak. |
| **Íslenska [Icelandic]** | Hér me l sir UBIQUITI NETWORKS yfir ví a UBIQUITI NETWORKS device, er í samræmi vi grunnkröfur og a rar kröfur, sem ger ar eru í tilskipun 1999/5/EC. |
| **Italiano [Italian]** | Con la presente UBIQUITI NETWORKS dichiara che questo UBIQUITI NETWORKS device, è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE. |
| **Latviski [Latvian]** | Ar o UBIQUITI NETWORKS deklar , ka UBIQUITI NETWORKS device, atbilst Direkt vas 1999/5/EK b tiskaj m pras b m un citiem ar to saist tajiem noteikumiem. |
| **Lietuvi [Lithuanian]** | UBIQUITI NETWORKS deklaruoja, kad šis UBIQUITI NETWORKS įrenginys atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas. |
| **Malti [Maltese]** | Hawnhekk, UBIQUITI NETWORKS, jiddikjara li dan UBIQUITI NETWORKS device, jikkonforma mal- ti ijiet essenzjali u ma provvedimenti o rajn relevanti li hemm fid-Dirrettiva 1999/5/EC. |
| **Norsk [Norwegian]** | UBIQUITI NETWORKS erklærer herved at utstyret UBIQUITI NETWORKS device, er i samsvar med de grunnleggende krav og øvrige relevante krav i direktiv 1999/5/EF. |
| **Slovensky [Slovak]** | UBIQUITI NETWORKS t mto vyhlasuje, e UBIQUITI NETWORKS device, sp a základné po iadavky a v etky príslu né ustanovenia Smernice 1999/5/ES. |
| **Svenska [Swedish]** | Härmed intygar UBIQUITI NETWORKS att denna UBIQUITI NETWORKS device, står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG. |
| **Español [Spanish]** | Por medio de la presente UBIQUITI NETWORKS declara que el UBIQUITI NETWORKS device, cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE. |
| **Polski [Polish]** | Niniejszym, firma UBIQUITI NETWORKS o wiadcza, e produkt serii UBIQUITI NETWORKS device, spełnia zasadnicze wymagania i inne istotne postanowienia Dyrektywy 1999/5/EC. |
| **Português [Portuguese]** | UBIQUITI NETWORKS declara que este UBIQUITI NETWORKS device, está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE. |

# Appendix F: Contact Information

## Ubiquiti Networks Support

Ubiquiti Support Engineers are located in the U.S. and Europe and are dedicated to helping customers resolve software, hardware compatibility, or field issues as quickly as possible. We strive to respond to support inquiries within a 24 hour period.

Email: **support@ubnt.com**

Phone: 408-942-1153 (9 a.m. - 5 p.m. PST)

### Online Resources

Wiki Page: **www.ubnt.com/wiki**

Support Forum: **www.ubnt.com/forum**

Downloads:  **www.ubnt.com/support/downloads**

91 E. Tasman Drive
San Jose, CA 95134
**www.ubnt.com**